DOCUMENT RESUME

ED 124 880 CS 002 723

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TITLE Improving Teacher Effectiveness in Reading Instruction through the Use of Behavior Modification.
PUB DATE 76
NOTE 14p.

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Behavioral Science Research; *Behavior Change; Effective Teaching; Elementary Education; Operant Conditioning; *Positive Reinforcement; *Reading Instruction; Reading Research; *Reinforcers; *Remedial Reading; Teaching Techniques

ABSTRACT

The purpose of this study was to investigate the efficacy of a behavior modification method for remediation of reading skills with ten primary grade students enrolled in a sixteen week program. Ten elementary school teachers enrolled in a graduate diagnostic and remedial reading course received eight hours of instruction, including the collection and verification of baseline data, the use of goal-establishment and conditioned reinforcers, and the development of an effective instructional environment. The ten children in the experimental group received instruction from graduate students through the use of games, teacher-made materials, and commercially prepared materials in addition to reinforcement of positive behaviors by verbal and written praise, self-monitoring of progress, and hardware such as an audio recorder. Standard instruction with no attempt at reinforcement was provided for a group of ten control subjects. Analysis of data after ten hours of instruction indicated that remediation of specific reading deficiencies is improved through the use of behavior modification techniques. In addition, it is noted that improvement does not depend on the use of materialistic reinforcers such as candy, tokens, etc. (KS)

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ED124880

Improving Teacher Effectiveness in Reading Instruction through the Use of Behavior Modification

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June 20,1976

CS002723

What are the effects of applying behavior modification techniques toward the remediation of reading problems of primary grade students? Will the use of behavior modification increase the student's efficiency in a particular reading skill area?

Behavior modification for instructional purposes is a systematically applied method aimed at altering specific behaviors. The steps of the method generally include (1) specifying goals, (2) determining criterion levels, (3) identifying behavioral procedures, (4) selecting reinforcers, and (5) providing a favorable instructional environment (Sulzer and Mayer. 1972).

Goals are the behavior changes which the student should exhibit as a terminal behavior. When using behavior modification for instructional purposes, the goals are the pupil product the teacher looks for after a period of instruction. For example, the goal of a series of lessons on sight words might be students' demonstration of immediate recognition of selected words.

Criterion levels relate directly to the identified goals and allow the teacher to specify an appropriate level of performance. By establishing criterion levels for each of several reading skills, teachers have a bases for identifying students who have mastered a particular skill or are making satisfactory progress. Criterion levels enable the teacher to make judgements about not only the skill development of individual students, but also about the effectiveness of the instructional program. Criterion levels selected may vary. For example, criterion levels for students learning sight words could be that 80 percent of the words taught must by correctly identified or that students must increase the number of words that they can identify on sight. Both of these sample criteria focus on

terminal behavior directly related to instructional goals. If the appropriate terminal behavior does not meet the identified criterion level, then the teacher might suspect that the instruction was ineffective or inappropriate for the students.

Following the identification of goals and success criteria, the next step is selecting a behavioral procedure. Because behavior change can take many directions ranging from strengthening weak behaviors to eliminating inappropriate behaviors, the procedure selected should reflect the desired results. Consider the sight word example introduced above. A student who correctly indentifies only a few of the sight words would require a behavioral procedure which attempts to extend this correct identification behavior to other sight words.

Reinforcers are stimuli that increase or maintain a specific behavior. They are classified as primary, conditioned, or generalized. Primary reinforcers are those which sustain or perpetuate life (basic needs). A primary reinforcer used with the identification of sight words might be allowing a child to eat lunch only after he correctly identified the sight words. (These kinds of reinforcers are not normally available to classroom teachers.) Conditioned reinforcers are stimulus that when paired with a specific behavior tend to increase or maintain that behavior. This type of reinforcer is the one most often cited in the literature as a means of increasing the frequency of correct responses (i.e., tokens, candy, money, ets.). However, praise, grades, free choice activities, charting, and so forth may also serve as conditioned reinforcer. The final classification of reinforcers is generalized. When conditioned and primary reinforcers serve to reinforce a wide range of behaviors, they are labled as generalized reinforcers. The degree to which generalized reinforcers affect behavior is related to the experiences of the individual.

That is, if an individual has not learned to associate certain stimuli, such as praise or grades, with specific behaviors, then these stimuli are not strong generalized reinforcers.

After selecting reinforcers which serve as rewards for appropriate behavior, an environment which assures that the appropriate behaviors are most likely to occur should be indentified. The most appropriate environment to produce a desired instructional behavior change is one that allows for the teacher to have control over the reinforcers and the behavior to generalize to the appropriate classroom situations.

Implementation of behavior modification should not be attempted until the student has had time to adapt to a new instructional situation. Thus, data collection on a specific behavior should be delayed until a student has spent some time in a new learning environment. After a student has had time to settle into a new situation, and the teacher continues to sense a problem, data are gathered on the specific behavior of interest. Measures are taken on the rate of incidence of this behavior. This procedure is called establishing a baseline. Collecting baseline data prior to implementing behavior modification is important for identifying the student's current level of performance, validating the stability of this performance, and comparing changes in behavior as a result of specific instruction.

This study investigated the efficacy of a behavior modification method for remediation of reading skills with ten primary grade students enrolled in a sixteen week remedial reading program. Ten elementary teachers, enrolled in an introductory graduate diagnostic and remedial reading course, received eight hours of instruction in the use of behavior modification methods for reading instruction. The instruction consisted of developing teachers' competencies in (1) collecting baseline data on a specific reading

skill, (2) verifying the baseline data with the use of individual diagnostic tests. (3) establishing goals for reading related to the baseline data, (4) identifying and using conditioned reinforcers readily available in most classrooms that minimize the use of materialistic rewards, (5) extending correct reading skill behavior by reinforcing only appropriate responses, and (6) providing an instructional environment for the direct application of the reading skill concurrently with remediation.

The teachers were all employed in local school systems within a twenty mile radius of Fort Wayne, Indiana. Mean years of teaching experience at the elementary level was 4.7. No teacher had less than two years of teaching experience. Role playing situations and mastery exams were used to instruct and assess the teachers' competence with the use of behavior modification, respectively. These data and observations supported the assumption that the teachers were competent to apply the behavior modification method for remedial reading instruction purposes.

Subjects were 28 primary level students attending a summer remedial reading clinic and were instructed by inservice teachers working toward a reading specialist degree. The clinic was supervised by two reading clinicians, and the students were taught on a one-to-one basis. All of the subjects had attended the clinic for four weeks and had received twenty hours of individual instruction prior to their assignment to a control or experimental group.

Twenty subjects were randomly selected and ten were randomly assigned to an experimental group and ten to a control group. These subjects were then randomly assigned to individual teachers within each group. Following the assignment of subject to teacher, both control and experimental teachers established baseline data for their subject. To minimize the effect of inaccurate baseline data, the investigator reviewed all of the

diagnostic findings to verify that the reading skill behavior identified for remedial instruction was, in fact, a reading skill deficiency.

Baseline data collected by the teachers revealed a broad range of reading skills in need of remediation. The skills identified included basic sight words, phonics, reading rate, comprehension, and letter identification. These skill needs varied for individual children, and although most of the subjects were weak in several skill areas it was decided to focus on remediation of the reading skill with which the subject was having the most difficulty. Because of the need to provide individual help in areas in which severe deficiencies were noted, no attempt was made to control the instructional variable. The decision not to control the instructional variable was based on both ethical and "real world" considerations. Because the research was not conducted in laboratory setting and the students were enrolled in the clinic to improve their reading skills, it would have been indefensible to disregard the subjects' needs simply because of a researcher's desire to control the instructional variable.

Following the establishment of baseline data the control teachers instructed their subjects through the use of games, teacher-made materials, and commercially prepared materials. These teachers followed their regular program of instruction which consisted of remedial reading instruction related to the established baseline data. No specific provisions were made to reinforce appropriate learning, and behavior modification techniques were not employed by the control teachers. The experimental group was instructed with similar and identical materials in addition to the use of the behavior modification techniques. Figure 1 presents an example of establishing basesline data and monitoring pupil's progress.

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insert figure 1

Teachers using the modification procedures were observed daily to ensure that the treatment was administered and that only appropriate reading behavior was reinforced. Reinforcers were selected that minimized materialistic gain and still reinforced application of the reading skill. Only reinforcers which accentuated and extended positive reading growth were used. Among the reinforcers identified and used by the experimental teachers were verbal praise, written praise, student-made graphs, wall charts, use of reading hardware, and free choice reading.

Verbal and written praise was incorporated in all instructional practices as often as possible. If the student was responding orally the modification teacher was to ignore all inappropriate responses and verbally reinforce only the correct response. The same procedure was followed with written activities except the reinforcement was recorded on the student's work. In addition, a short summary of what the child had learned and accomplished was used at the end of each instructional session. This summary was intended to help the children better understand what they had learned, to help them understand how this learning would improve their reading skills, and to nurture an attitude of self achievement and success in reading. Although it was difficult to statistically verify the effect that the summary period had on the children, several parents indicated that their child was able to better discuss with them what they had learned, as well as exhibiting an improved attitude about coming to the reading clinic.

A typical reinforcer used by several of the behavior modification teachers relied upon the students monitoring their own progress. Two examples of this system were the use of charts and wall pockets. Student's charting of their own progress was emphasized for reading skills which dealt with the Dolch Words, comprehension, and reading rate. For example,

the total number of Dolch Words correctly identified during each instructional period were marked daily on the student's graph. During discussion periods about interpretation of the graph the teacher emphasized that the student was competing with himself and that an upward trend indicated improvement. A similar procedure was used with small pocket charts in which the words correctly identified were place in the appropriate pocket and the number of the words in the "Words Correct" pocket were recorded on a daily basis.

Hardware such as the Language Master and the audio recorder were also used to reward appropriate behavior and better utilize application of the reading skill learned. Sight words which the child had learned were used in context on the Language Master to serve both as a reinforcer for appropriate learning and provide for application of the skill. Also, the audio recorder served to reinforce learning, present examples of words in context, record responses to comprehension questions, record daily progress of the students, and record short language experience stories.

Charts and other reward systems were for individual students. A student was in competition only with himself. Charts used for recording student progress were never displayed in the classroom or compared with those of other students in the program.

Following ten hours of instruction the subjects took a post-test and returned to the regular program. Tables 1 and 2 present the findings for the experimental and the control group between pretesting (baseline) and posttesting. Significant differences ($p < .001$) were noted for the experimental subjects and all of these subjects exhibited positive growth in the identified reading skill area. The control group did not reflect a significant difference ($p < .09$) in remediation at the .05 level of significance.

insert table 1

insert table 2

These analysis suggest that remediation of specific reading skill deficiencies with primary level students is improved through the use of a behavior modification technique. The behavior modification technique used does not have to rely on conditioned reinforcers which are materialistic in nature, i.e., candy, tokens, etc. These data confirmed the utility of using conditioned reinforcers of a non-materialistic nature that are readily available in most classrooms and that emphasize application of the reading skill learned. The use of charting, stop watches, verbal and written praise, and reading hardware proved to reinforce and extend the desired reading behaviors. Finally, behavior modification appears appropriate for use with a wide variety of reading skill areas as evidenced by the range of skills which were identified as requiring remediation and, in fact remediated in this study.

Further research is needed to identify a wider variety of reinforcers which are (1) available to most teachers in a regular class room; (2) effective for promoting either long term or short term reading skill development; and (3) conducive to motivating reading skill improvement, reading interests, and a desire to read.

References

Sulyer, Beth and G. Ray Mayer. Behavior Modification Procedures for School Personnel. New York, New York: Holt, Rinehart and Winston, 1972.

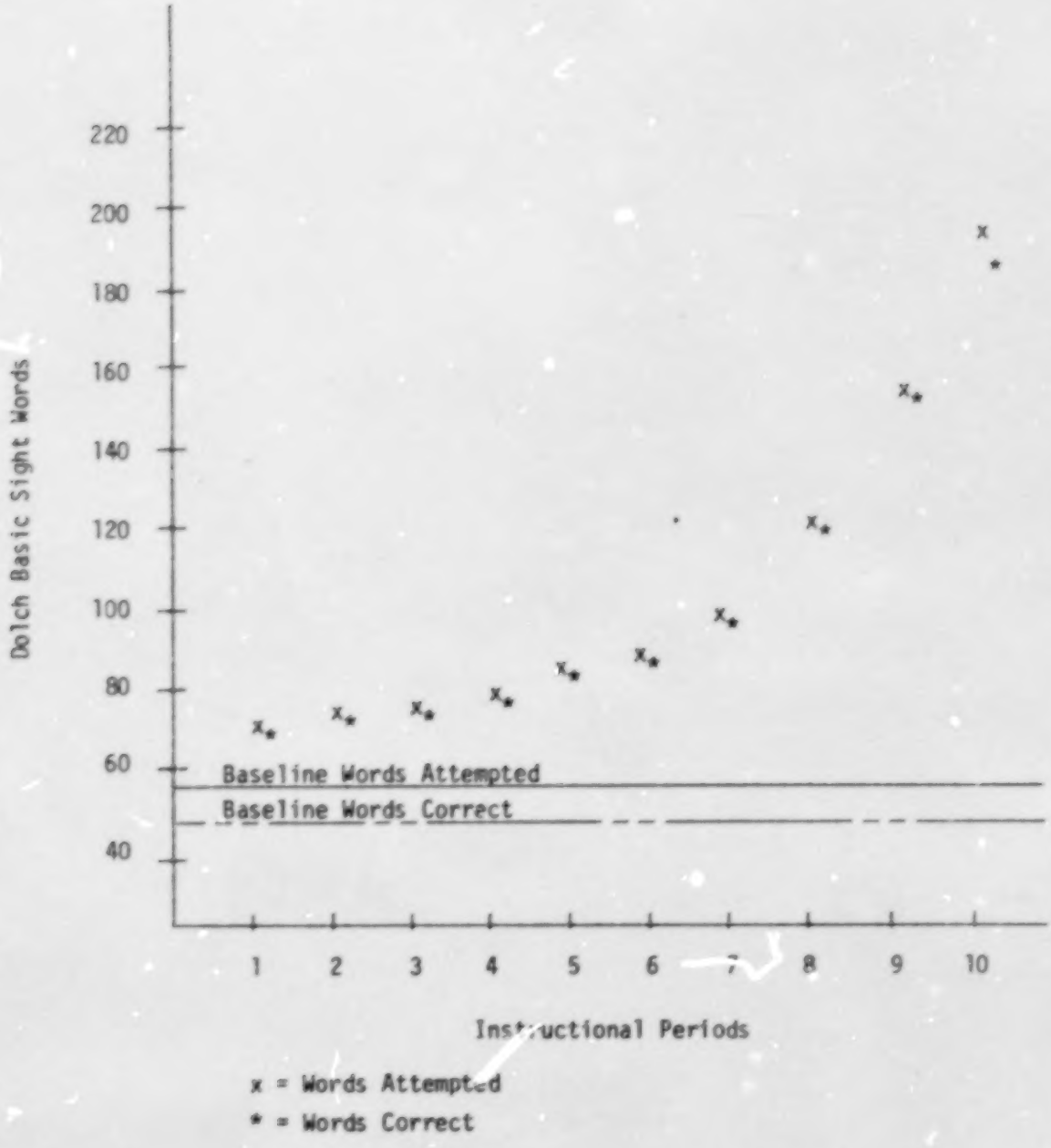

Figure 1

Example of established baseline data and pupil's progress with behavior modification techniques

Table 1

Test of Significance with Pre- and Posttest Data
for the Experimental Group (N=10)*

Subject	Reading Skill Instruction	Pretest Mean	Posttest Mean	Sign
1	Consonant Blends - Incorrect	17.6	4.75	+
2	Comprehension - Literal Questions Correct	76%	92%	+
3	Vowel Diagraphs - Words Correct	33.62	48.43	+
4	Sight Words (Dolch Lists)	56.00	165.00	+
5	Sight Words (Dolch Lists)	50.00	90.00	+
6	Sight Words (Dolch Lists)	183.00	206.00	+
7	Sight Words (Dolch Lists)	27.00	56.00	+
8	Phonics Analysis - Words Correct	10.00	26.00	+
9	Words Per Minute (Reading Rate)	72.60	119.25	+
10	Sight Words - Correct	21.00	46.00	+

N = 10
$\underline{X}$ = 0
*p < .001

Table 2

Test of Significance with Pre- and Posttest Data for the Control Groups (N=10)*

Subject	Reading Skill Instruction	Pretest Means	Posttest Means	Sign
1	Letter Identification	14.00	26.00	+
2	Sight Words (Dolch List)	31.00	31.00	o
3	Sight Words (Dolch List)	65.00	92.00	+
4	Sight Words (Dolch List)	46.60	68.33	+
5	Sight Words (Dolch List)	120.00	116.60	-
6	Whole Word Identification	14.00	18.00	+
7	Beginning Consonant Sounds	12.00	31.00	+
8	Consonant Blends - Correct	16.00	14.00	-
9	Comprehension - Literal Questions Correct	40%	80%	+
10	Phonic Analysis - grapheme/ phoneme correspondence	8.00	14.00	+

N = 9
$\underline{X}$ = 2
*p < .09